MARINE REVIEW.

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Report All Groundings.

The recent account of the American clipper ship Oakes picked up at sea directs attention to the great brotherly fellowship existing among ocean-going vessel masters and owners. It is a lesson that should appeal to every vessel man, whether on fresh or salt water, and the spirit of great friendship which it teaches might be applied in more cases than those in which loss of life is actually involved.

The Oakes was long overdue and given up for lost. When finally sighted by the steamer Kasbec, she was drifting before the wind without a person on board who had sufficient strength to guide her. On account of a gale blowing at the time, the steamer had to stay by and wait for the weather to moderate. This was no small undertaking to begin with, as it lasted all through a night of storm and darkness, and when daylight returned the men on the steamer found that the vessel they stood by had disappeared. But their desire to assist the unfortunate crew of the sailing ship was too strong to permit them to give up the effort. With a prospect of a severe reprimand from his owners, and financial loss for delay if he was unsuccessful, the captain of the steamer turned about to begin what would seem to be a most hopeless search. But when his quest proved successful and the ship was again caught up with, he at once found volunteers to board her, without considering for one moment what pest was before them.

This is only one of many instances of a similar nature reported during the past eventful winter on Old Ocean. It would seem, in fact, that this kind of vessel master feels that he is in reality his brother captain's keeper. His efforts are not always of the kind in which honor or great reward is sought. He will go out of his course to advise any passing ship, great or small, of some menace to navigation which he has found in his passage. He will also report such matters to his owners, or to government officials whose duties relate to these things. They will in turn disseminate the information among captains and owners, and thus all are forewarned and forearmed.

This is just the spirit that will be required during the coming season more than ever before on the lakes. We have now increased facilities in the depth of water, and will, without doubt, find shoal spots and reefs that were unthought of in the past. Vessels will ground in places which, with the old depth of loading, were thought to be entirely free of obstructions. It would seem necessary, therefore, to earnestly impress upon all owners and captains the importance of assisting each other by making public every scrap of information regarding such places. If a vessel strikes and passes on without apparent injury the master or owner may think that as there is no harm done the occurance may as well pass without notice. But there is harm done to all other vessels if such accidents are not reported, as one vessel may strike at an angle that lets her off without damage, while another vessel may strike the same spot from a different direction and suffer heavy loss. Again, how can the shipping interests obtain improved conditions if obstructions are not reported to the proper authorities for investigation. Freedom from disaster and damage means lower insurance premiums for vessels owners and shippers, and it is in every one's power to assist in bringing this about.

The columns of the Marine Review are open for all information of this kind and we will gladly do our best to bring such reports to the attention of the proper authorities. Executive officers of the Lake Carrier's Association are also interested in the same work, and communications on this score addressed to Capt. Geo. P. McKay, Cleveland, will receive prompt attention. In the matter of disseminating such information, the United States hydrographic service is also interested, and communications addressed to the branch officers of this service in Chicago and Cleveland will find a place in the publications of the service, and will be used later in the correction of charts.

It should hardly be necessary to impress vessel men with the fact that they are serving their owners interests in making these reports, and that the information should include all cases where the bottom is felt under any conditions.

Inadequate Means for Towing.

The Boston hydrographer in a communication to the Boston Journal last week called attention to breakdowns of steamers at sea. He claims that some twenty steamers have been disabled by broken shafts or other difficulties within the past four months. He says: "By reading the various accounts relative to these disabled ships, I learn that they have reached port in tow of some friendly ship, but I have been profoundly impressed with the inadequate means employed or at command for successful towing by the ordinary steamship. In many instances they failed to hold and handle the disabled crafts after they had succeeded in getting a hawser to them." He adds that the captain and mate of the Templemore were killed by the parting of the steel hawser with which she was being towed.

The only remedy for towing in a heavy sea, or prevention for parting of hawsers, is a machine manufactured by the American Ship Windlass Co., Providence, R. I. It is called a steam towing machine, and it automatically takes up the slack and responds to the abnormal strain on the hawser. These machines are in general use on the lakes and give perfect satisfaction.

Yachts for Millionaires.

It is said that Howard Gould's new yacht, which has been so much talked about, and for which a contract has finally been let to the Harlan & Hollingsworth Co., Wilmington, Del., is to be the finest and costliest yacht on earth. She is to be ready for commission in April 1898, and is to be entirely of steel, barque-rigged, with twin triple expansion engines. Dimensions are 270 feet long over all, 245 feet water line, 36 feet beam, 20 feet deep and 1,900 tons measurement. It is said she will be commanded by Capt. W. G. Shackford, formerly commodore of the Pacific Mail fleet and who has long held the confidence of the Gould family. She will be named Niagara.

James Gordon Bennett, who owns the New York Herald, but who spends little of his time in this country, has finally decided to have his new yacht built by A. & J. Inglis on the Clyde. This vessel will be 300 feet over all, 260 feet on the water line, 35 feet beam, and 1,500 tons, Thames measurement. She will be built of steel, flush plated, with continuous edge strips fitted in the sides. There will be two sets of triple expansion engines to drive the twin screws, with cylinders 22½, 38 and 40 inches in diameter by 42 inches stroke.

In General.

W. I. Babcock of the Chicago Ship Building Co., was one of the guests on the trial trip of the battle ship Iowa.

Advertisements will be issued by the navy department shortly for the construction of a model tank at the Washington navy yard, which was provided for by an appropriation of $100,000. The tank will be covered by a plain but substantial brick building, and will be completed in about a year.

It is reported that Collis P. Huntington and a company of English and American capitalists will shortly establish a large ordnance and armor plate factory at Newport News, Va. Mr. Huntington recently went over the ground, and it is said selected a site for the mammoth enterprise near the ship building plant in which he is largely interested. It is stated that the capital of the new concern will be between $3,000,000 and $5,000,000, half of which will come from abroad.

Another vessel of the navy, the cruiser Atlanta, is to have a combination of water tube and Scotch boilers. Four Scotch boilers are being built for her at the New York navy yard and the department will, in a few days, advertise for bids on four tubular boilers. Engineer-in-Chief Melville made a strong effort to persuade the department to equip the Atlanta with twin screws, but such permission was refused, notwithstanding that the vessel's speed could be increased at least two knots by their use. It is proposed to pay $39,000 for the tubular boilers.

Reduction in Grain Shoveling Charges.

Another reduction has been made by the Western Elevating Association of Buffalo in the grain shoveling charge. The charge to vessels at Buffalo this season will be $3.35, instead of $3.50 as charged last season. It is expected, of course, that the elevators of Erie and Fairport will make a like reduction. This concession of 15 cents per thousand to the vessel interests comes out of the charge made for the use of steam shovels and not from the men employed in shoveling the grain. Although the Lake Carriers' Association certainly has every reason to feel grateful to the committee that has had this matter in charge, especially as their work has been voluntary and the task not a pleasant one, still it can not be said that vessel owners as a whole will feel entirely satisfied with this reduction. It is well known that the executive committee of the Lake Carriers' Association, through its members in Buffalo, presented some very strong facts and figures to the elevator owners on the question of prices charged for the steam shovels. But the fact that any reduction has been obtained for this year is creditable to the committtee that has had the matter in charge. The members of the committee are Capt. J. J. H. Brown, P. P. Miller and John Kelderhouse, and their report as submitted to President James Millen of Detroit, under date of April 13, is as follows:

"The committee appointed by you at the last annual meeting of the Lake Carriers' Association to endeavor to secure a reduction in the grain shoveling charges at this port, beg to report as follows: The said committee has this day made an agreement by which the shoveling charges are reduced from $3.50 per thousand bushels to $3.35, the reduction to take effect to-day, and to continue in effect all of this year. Your committee would have been pleased to report a greater reduction in the charge, but the reduction effected is the result of a great deal of patient application to the business in hand, and when you consider that any reduction effected in these charges is at the expense of some other interest, we trust you, and vessel owners generally, will be satisfied with what has been accomplished.

"On the basis of last season's total receipts of grain, including flax seed, at all elevators at this port, in and out of the association, amounting to about 173,000,000 bushels, the saving in this instance to the vessel interests would amount to $25,950. By the arrangement effected by the Lake Carrier's committee two years ago, a saving of 50 cents per thousand was effected, which would amount to $86,500. Three years ago another committee secured a reduction of 25 cents per thousand in shoveling charges, which on the basis of last season's receipts would amount to $43,275, or a total of $155,725 saved per annum on the basis of last year's receipts at this port; all of which has been accomplished by committees appointed by the Lake Carriers' Association from time to time, and that without one dollar of expense to the association.

The gain does not end with the saving at the port of Buffalo, for heretofore the price at Erie and Fairport has been the same as the price at Buffalo, and it is to be expected they will be the same this year."

Mr. Kemp, representing the J. B. Carr Co., chain manufacturers of Troy, N. Y., has just finished calling on lake customers. The Carr company uses the famous Burden iron for their chain, and this gives it a strength that is desirable for special work. Chain used in connection with the steering engine of the Grand Duchess, and in fact all chain used by the Newport News Co., is furnished by the Carr company. The demand for Burden iron is such that seven concerns take their entire output, and the price has been reduced only once in the past ten years.

The Canadian Marine Association is made up largely of owners of Canadian vessels employed on the lakes, and its objects are the same as those of the Lake Carriers' Association. At a recent meeting in Toronto, with R. O. Mackay of Hamilton in the chair, this organization entered a strong protest against the bridging of navigable rivers in the dominion, and a committee was appointed to visit Ottawa with a view to securing legislation against such obstructions.

A Very Desirable

train to take when going to New York is Pennsylvania No. 6, leaving Union station 1:40 p. m. daily and from Euclid avenue 1:50 reaching New York 7:40 next morning. Pullman sleeper through without change. Supper served in dining car. Apl 15

Preparing for the Gas Buoys.

In the last issue of the Review notice was given of eight points on the lakes where gas buoys will be established before navigation is fully open this spring, and there was printed also a list of some forty shoals, dangerous turning points, etc., where, in the opinion of members of the Ship Masters' Association at Cleveland and Buffalo gas buoys would be of great assistance. This list, which is now supplemented by additional suggestions from the ship masters of Buffalo, Detroit, Milwaukee and Chicago, is being made up by Capt. George P. McKay of Cleveland, who is chairman of the Lake Carriers' committee on aids to navigation, and who is preparing for a large shipment (probably thirty-five) of these buoys, which will be received from the lighthouse board at Washington shortly after the passage of the sundry civil appropriation bill, which will be passed in a few days, and which contains an appropriation of $25,000 for buoys of this kind to be furnished to the lakes. Suggestions from the ship masters at the points named above designate the following places, in additon to those published a week ago:

Lake Ontario—Galoo island shoal; Hinckley point spit; Calf island reef; Monteagle shoal.

Lake Erie—Niagara reef; Scott's point; Mouse island shoal.

Lake Michigan and Straits of Mackinac—Outer end of Hyde Park reef, off Chicago; South Park shoal; Nine-foot shoal, at "Death's Door," Green bay; Wigins' point shoal; south point, Milwaukee; shoal E. S. E., 1¾ miles from Gray's reef; Drisco shoal, Green bay; Flat Rock shoal, Escanaba; Mackinaw harbor; Outer shoal, Pilot island; Green island shoal, Green bay; new shoal between Gray's reef and Skiligalee; Lansing shoal, Green bay (not the Straits, where buoy is already provided).

Lake Superior—Grand island harbor, east entrance; Grand island harbor, west entrance; Big bay point.

A Great Army of Ship Builders.

The capital sunk I should not like to estimate in black and white, but if I said that it took $6,250,000 a year to pay the wages of the ship building and marine engineering operations in the upper reach—one-half, that is—of the Clyde, will anybody believe me? And yet anybody can satisfy himself on the point. Of marine engineers alone there are over 9,000 employed on the Clyde, and in the boiler shops slightly over 3,000 more men; in the ship yards a full muster of fitters, platers, rivetters, caulkers, carpenters, joiners and laborers would add more than 30,000; and over and above would have to be included an army of draughtsmen, clerks, timekeeprs and counters in proportion. These are official figures. Belfast, where no official figures are available, may safely be set down as employing 6,000 men, and about half that total is the measure of the industrial activity in one commercial capital of Ireland. Taking the extensive repair work into consideration, 5,000 men represent about the total on the Mersey; in the royal dock yards at Pembroke, Devonport, Portsmouth, Chatham and Sheerness, 23,049 men are employed, of whom about a third are in the engine shops; and on the Thames, which is, despite its decadence in ship building, an engineering centre, the total number of men employed in the industry is approximately 8,000—3,000 shipworkers and 5,000 engineers. Of the northeast coast of England I am unable to speak with authority, because the official figures of the men employed are not at hand as I write, but I should say that the total, including the Humber, is not far short of 70,000, of whom about two-thirds are ship yard hands. The figures I have given refer purely to the ship building and engineering departments.—Robert McIntyre in Cassier's Magazine.

About $250,000 is being expended in improving the plant of the Otis Steel Co. of Cleveland. The capacity of open hearth furnaces is being increased and electricity is being applied to a large part of the machinery. The erection of blast furnaces in connection with the steel works is contemplated for next year.

The large single-sheet chart of Georgian bay, just issued by the British admiralty, was prepared from the surveys on which Staff Commander J. G. Boulton, R. N., has been engaged for several years past. This chart may be had from the Marine Review for $1.75. The price is higher than is usually charged for navigators' charts, but this one takes the place of probably ten sectional charts and is corrected up to date.

A Great Battleship.

It should be a matter of considerable pride to all Americans that the Iowa, first modern first-class sea-going battleship built for the United States navy, has proven herself equal to the best vessels of war that ride the waves. She is the largest and most powerful of our battleships and is also the speediest. As the last of the premium-built battleships, she has done well for her builders, the William Cramp & Sons Ship & Engine Building Co. of Philadelphia, earning $200,000 for them by making an average of 17 even knots an hour over the regular government course off the Massachusetts coast in the four hours' speed trial required by the government under the contract.

The Iowa is 360 feet long and 72 feet beam, and she has a displacement loaded of 11,410 tons. Three thousand tons of the weight is devoted to armor, which ranges in thickness from 2¼ inches to 15 inches. The ship is driven by twin-screw, triple expansion engines of about 11,000 horse power. The normal coal supply will be 635 tons, with a total bunker capacity of 1,780 tons, and on the maximum allowance, at a ten knot cruising speed, the Iowa could steam continuously for thirty-one days, covering a distance of 7,400 knots. The crew will consist of 444 men. A striking feature of this ship is the unusual height of the smoke stacks, which extend 100 feet above the grate bars. They are carried up to this height to secure a powerful natural draught, and reduce the forced draught air pressure in the stokehold. Vertical air pumps for the main condensers and vertical duplex admiralty feed pumps are of the Blake type, as are also the fire, water service, wrecking, bilge pumps, etc.

The main armament, consisting of four 12-inch guns, is in two large turrets, located fore and aft on the axis of the ship, which are plated with 15-inch Harveyized steel. Between the main turrets and well out on the sides of the ship are four smaller turrets, each of which contains two 8-inch rifled guns, which discharge an armor piercing shell weighing 250 pounds, that is capable of penetrating 8 inches of steel at a distance of two miles. In addition to these guns there are six 4-inch rapid fire guns, which discharge thirty-three pound shell with such rapidity that five of them can be kept in the air at the same time, and in addition to these the ship carries in her military tops and on the gun deck, and in various advantageous positions along the superstructure and upon the bridges, twenty six-pounders, six one-pounders and four Gatlings, all of which are rapid fire guns, and are capable together of pouring out a perfect hail of small shot and shell upon the defenseless and lightly protected parts of an enemy.

It would cost about $50,000 to insure in full for the coming year the twenty-four vessels managed by J. C. Gilchrist of Cleveland. Directors of the two corporations controlling these vessels have decided to carry no insurance. The vessels are largely of the smaller class and it is expected on the present freight outlook that they would make little, if any, money if they had full insurance premiums to pay. The directors figure that they can lose a couple of their wooden tow barges, or a small steamer and barge, and still be better off at the end of the year than they would be if they had insurance premiums to meet.

An excellent chart of Green bay and approaches, on a large scale, has just been published by the United States Hydrographic office and may be had from the Marine Review. The chart is corrected to March 1, 1897, and takes in with Green bay the west shore of Lake Michigan from Manistique to Kewaunee. It will be of great value to masters of Lake Michigan trading vessels, as well as the men in charge of the larger ore and coal carriers trading to Escanaba. Soundings are in feet and there is a scale of statute miles attached. The price is $1.25, but the chart is so complete in detail that it is larger than the single sheet charts of Lake Superior or Lake Michigan.

Low Rates via the Nickel Plate road to New York city and return. Tickets will be on sale April 23d to 26th inclusive, account dedication of Grant's monument. Return limit May 5th. 29 Apl 23

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A. Gallagher, Chicago Lodge. J. A. Holmes, Grand Chaplain. Alex Clark, Buffalo Lodge. E. C. Benham, Past Grand Pres. Bernard Nelson, Grand Marshall. C. T. Brown, Bay City Lodge.

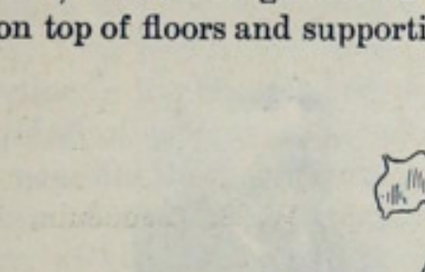
H. Leisk, Milwaukee Lodge. H. Zealand, Port Huron Lodge. W. A. Collier, Grand Fin. Secy. GEO. McCULLAGH, Grand President. Lyman Hunt, Grand Treasurer. H. F. Loftus, Chicago Lodge. E. Saveland, Milwaukee Lodge.

C. L. Wilson, Detroit Lodge. Henry Root, Toledo Lodge. A. J. McKay, Grand Warden. W. E. Rice, Grand 1st Vice-Pres. F. J. McCabe. Buffalo Lodge. Robt. Young, Grand 2d Vice-Pres. J. A. Ward, Grand Sentinel. M. Christy, Toledo Lodge. T. E. Walker, Marine City Lodge.

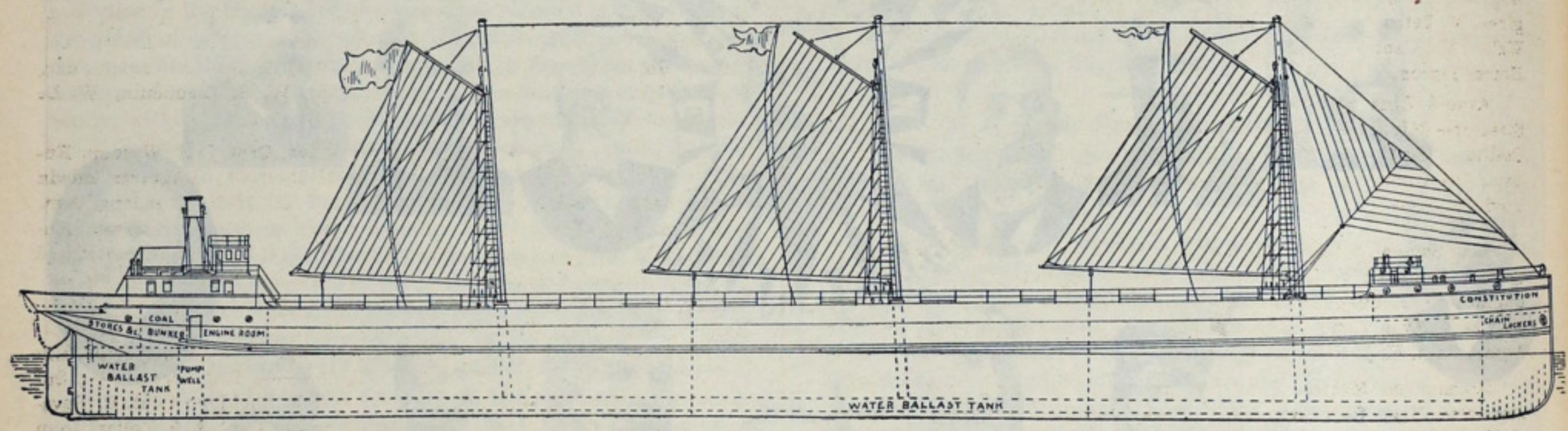
OFFICERS AND REPRESENTATIVES OF THE GRAND LODGE, SHIPMASTERS' ASSOCIATION.

Ship Building at West Superior.

West Superior, Wis., April 14—It is well known here that members of the firm of Pickands, Mather & Co., who will own the new steel tow barge Constitution, now nearing completion at the yard of the American Steel Barge Co., are very much pleased with the vessel and everything pertaining to her construction. They have had more experience than most vessel owners on the lakes in the construction of steel vessels, and their requirements in this ship, together with the desire of the builders to turn out a first-class freight carrier, have combined to make the Constitution the equal of any craft of her kind afloat. She is a single-decked tow barge for bulk freight only, with main deck beams but no laid deck, except at forward and after ends. The spar deck forward is raised to the height of main rail to form a forecastle deck. The deck house aft, with pilot house on top and towing machine house forward, is of steel. Accommodations for the crew are on the main deck forward and in the deck house aft. There are three collision bulkheads, one forward and two aft, the space between the two after bulkheads to be used as a wrecking well and containing header and valves with stems leading up for access from the engine room floor. The vessel is built on the channel system , with three girders on each side of center, running fore and aft on top of floors and supporting the tank top; the second girder from the center running down and connecting to the bottom plating. All of the plating is of open hearth mild steel having a tensile strength of 52,000 to 62,000 pounds per square inch, the limit of phosphorus not exceeding .08, elongation not less than 24 per cent. in eight inches and a reduction in area of not less than 45 per cent. Rigid specifications in this regard have also been applied to rivets and all other parts. Dimensions and other leading particualrs of the vessel are: Length over all, 379 feet 6 inches; length between perpendiculars, 366 feet; beam, moulded, 44 feet; depth, moulded, 26 feet; gross tonnage, 3,231.30; net tonnage, 2,997.76; tank top of steel, ½ inch thick, covered at bilges with steel ceiling; hatches eleven in number and all 24 feet between centers; three steel spars and three steel wrecking wells. Among new features of this vessel are wire mooring lines, an extra collision bulkhead aft and steel bilge ceiling. In the strong-backs of the hatch coverings there is also a new feature. Instead of the hook at the end of the strong-back, a casting will be riveted onto the coaming and the strong-back fitted into it. Ventilation will be afforded in the hold, and windows in the houses will be 14 inches in size and round.



JOSEPH KIDD.



STEEL TOW BARGE CONSTITUTION.

A. C. DIERICX.

It is probable that there is no ship yard on the lakes where the executive force is more harmonious in its work than are the men in charge of this yard. Capt. McDougalls' chief assistants are Joseph Kidd, superintendent, and A. C. Diericx, chief draughtsman. Joseph Kidd is well known to ship builders and structural workers all over the country, as he was in business for himself on the coast previous to his engagement with the American Steel Barge Co. He is conversant with machinery of all kinds, and his knowledge of engines, boilers, etc., is of great value to him in a yard like this one, where a variety of work is presented. Mr. Kidd has made many friends here and among vessel men from all parts of the lakes who have dealings with the ship yard.

A. C. Diericx, the chief draughtsman, has been in this country only four years, but he had received a thorough training before coming here and has since acquired a good knowledge of lake practice. His early training was in the office of Oswald, Moredaunt & Co., Southampton, England, and he was later employed with some of the best known ship building concerns on the other side. For two years he was on the staff of Prof. J. H. Biles and he was also with Thomas Royden & Sons of Liverpool for several years.

In the construction of this vessel the builders have been represented by Robert Curr of Cleveland.

Lake Superior Charcoal Iron.

It would seem that the amalgamation of the sales interests of Lake Superior charcoal iron manufacturers in one company, the Superior Charcoal Iron Co. of Detroit, will result to the advantage of consumers of this kind of iron, as well as the manufacturers and the large number of workmen engaged in the industry at several points in Michigan and Wisconsin. "One of the main objects of this change in the method of conducting our business," says one of the officers of the new company, "is to suit the requirements of customers in the quality of iron that will be furnished to them, thereby increasing the uses to which our product will be applied. Ruinous competition has worked a double injury to the business, as the tendency towards cheapness and poor product has shut out charcoal iron in places where it should be used. Just as the makers of steel forgings are doing a great deal of missionary work in proving the advantages of their forgings, as against the cheaper products in wrought iron, so will this new company aim to increase the demand for charcoal iron."

Since the first of the present month the new company has been in control of all sales business connected with the eight companies that now have charcoal iron furnaces in blast in the Lake Superior region.

The officers of the new company are: Wm. G. Mather of Cleveland, president; W. H. Hinkle of Ashland, Wis., vice president; F. B. Gaylord of Detroit, secretary and treasurer; J. C. Holt of Mancelona, Mich., and Wm. Gerhauser of Detroit, sales managers. Headquarters are at 66 Newberry building, Detroit.

Subscribers to the Review who wish to have it sent to them during the navigation season in care of the marine postoffice, Detroit, are requested to send in notification to that effect at once. It will be impossible to make changes in accordance with past seasons. Papers will be continued to old address unless orders to change are received.

Appointments of Captains and Engineers for 1897, vest pocket size, $1.00. Order from the Marine Review, Cleveland, Ohio.

Appointments of Captains and Engineers.

Teagan Bros., Detroit: Steamer—Hurlbut, Capt. J. C. Maddock, Engineer J. C. Bennett. Schooner—D. K. Clint, Capt. Burt Peltier.

Ralph, P. J., Detroit: Steamer—S. J. Macy, Capt. M. W. Gotham, Engineer W. F. Gregory. Barge—Mabel Wilson, Capt. J. E. Gotham.

Sharp, W. H., Bay City, Mich.: Steamer—James P. Donaldson, Capt. M. Canartney, Engineer A. Wilcox. Schooner—A. W. Wright, Capt. James Bennett.

Merchants Line, G. E. Jacques & Co., Montreal, Can.: Steamers—Cuba, Capt. H. Chestnut, Engineer E.L.Foley; Melbourne, Capt. R. Chestnut, Engineer Thos. Milne.

Goodman, F. C., Cleveland: Steamers—W. L. Wetmore, Capt. John D. Mullen, Engineer C. T. Martin; Keystone, Capt. Carlton Graves, Engineer Wm. Carrick. Schooners—Brunette, Capt. Henry Holmen; J. G. Masten Capt. ——.

Sullivan, L. S, Toledo, O.: Steamer—D. W. Rust, Capt. Wm. J. Seavor. Schooners—C. C. Barnes, Capt. Geo. W. Burtes; John Schuette, Capt. Jas. Robinson; H. H. Badger, Capt. Oscar H. Brown; Chicago Board of Trade, Capt. Geo. R. Bonnah.

Adams, Thomas, Detroit: Steamers—Tom Adams, Capt. Duncan Nicholson, Engineer James Kelley; Jesse H. Farwell, Capt. J. D. Duncanson, Engineer John Johnston; F. E. Spinner, Capt. ——, Engineer——. Schooner—J. H. Rutter, Capt. John Eberlein.

Blodgett, O. W., Bay City, Mich.: Steamers—C. H. Bradley, Capt. James Bennett, Engineer George M. Hopkins. Schooners—Mary Woolson, Capt. F. H. Lennon; Peshtigo, Capt. L. D. Bennett; Brightie, Capt. John Lovell; Goshawk, Capt. M. Nagle; B. W. Jenness, Capt. Thomas Turner.

Hepburn, A. W., Picton, Ont.: Steamers—Alexandria, Capt. B. Smith, Engineer Chas. McWilliam; Empress of India, Capt. Geo. O'Brien, Engineer M. Tetro; Aberdeen, Capt. M. Heffernan, Engineer George Gown; Water Lily, Capt. ——, Engineer ——. Schooner—Onteora, Capt. Homer Perron.

Arnold Line Steamers, G. T. Arnold, Mgr., Mackinac Island, Mich.: Steamers—Minnie M., Capt. William McCarty. Engineer M. C. Flanders; Ossifrage, Capt. J. B. Mondor, Engineer Patrick Eustace; Chas. West, Capt. Jos. Goodreau, Engineer Geo. Densmore; Islander: Capt. ——, Engineer ——.

Neff, Samuel & Sons, Milwaukee: Steamers—Edwin S. Tice, Capt S. O. Neff, Engineer S. R. Newnham; Adella Shores, Capt. Samuel Neff, Engineer P. Kennan. Schooners—Sidney O. Neff, Capt. George Olsen: Charles N. Ryan, Capt. Joseph Gillard; City of Toledo, Capt. ——; D. S. Austin, Capt. H. J. Nelson.

Graham & Morton Transportation Co., Benton Harbor, Mich.: Steamers—City of Chicago, Capt. Chas. McIntosh, Engineer William J. McClure; City of Milwaukee, Capt. John Stewart, Engineer C. L. Barron; City of Louisville, Capt W. A. Boswell, Engineer W. F. Johnson; Frank Woods, Capt Chas. Plummer, Engineer Chas. Moreland.

Flint & Pere Marquette Railroad Line, Ludington, Mich.: Steamers—F. & P. M. No. 2, Capt. R. Hazlebarth, Engineer Geo. Depuy; F. & P. M. No. 3, Capt. Chas. Thompson, Engineer H. Nyland; F. & P. M. No. 4, Capt. Jos. Russell, Engineer F. McLaren; F. & P. M. No. 5, Capt. John J. Doyle, Engineer Geo. J. Lynn; Pere Marquette, Capt. F. A. Dorrity, Engineer Robt. McLaren.

Lackawana, Transportation Co., Buffalo: Steamers—Lackawana, Capt. Frank Weinheimer, Engineer W. B. Lewis; Scranton, Capt. James H. Green, Engineer Charles Van Every; Russia, Capt. John D. Green; Engineer William Brown; Arthur Orr, Capt. John Massey, Engineer Edward A. Carter; Chili, Capt. James Gibson; Engineer A. J. Wilson; Florida, Capt. Henry Murphy, Engineer Geo. M. Wise; Wyoming, Capt. Andrew Kelley, Engineer George Bohnert; Geo. J. Gould, Capt. W. M. Cottrell, Engineer George A. Butler.

Hall, Geo., Coal Co., Ogdensburg, N. Y.: Steamers—Hecla, Capt. D. Hourigan, Engineer D. M. Doyle; W. L. Proctor, Capt. W. A. Russell, Engineer A. E. Cline; Thos. Wilson, Capt. Jos. Richard, Engineer Jos. Conliff; Curlew, Capt. P. J. McGrath, Engineer G. W. Cline. Schooners—Sherman, Capt. C. W. Howard; Bolivia, Capt. Jos. Gooden; Mary Lyon, Capt. S. La Flam; Jennie Mathews, Capt. F. D. Lunn; Beals, Capt. Geo. Cote, Diamond, Capt. Alex Robideau; Argosy, Capt. John Gokey; Onondaga, Capt. Isidor Brunett; Mohawk, Capt. Laurent Vernier; Richard, Capt. Chas. Richard.

Ogdensburg Coal & Towing Co., Ogdensburg, N. Y.: Steamers—Geo. D. Seymour, Capt. Geo. Clifford, Engineer Hugh Goodheart; Myra, Capt. James Martin, Engineer C. J. McSorley. Barges—H. B., Capt. Michael Rodrigue; England, Capt Narcisse Lalonde; Ireland, Capt. Damas Latour; Scotland, Capt. Louis Sova; Aid, Capt. Theodule Lepine; James Buckly, Capt. Joseph Lalonde; Menominee, Capt. Timothy Hunt; Henry Whitbeck, Capt. John Mallett; Isaac Stephenson, Capt. ——; Fred Carney, Capt. Adelor Demers; Argo, Capt. Henry Newhouse; Hoboken, Capt. Edward Maloney.

Booth, A., Packing Co., Chicago: Steamers—Oval Agitator, Capt. Jno. Nolan, Engineer Wm. Boyce; Valiant, Capt. Daniel McCauley, Engineer Edward Hagerty; F. R. Anderson, Capt. Thos. Hadland, Engineer Ward Beatty; R. W. Currie, Capt. Chas. Nagglegard, Engineer Jno. Lynch; T. H. Camp, Capt. Jno. Sevoras, Engineer Geo. McNeil; H. R. Dixon, Capt. J. F. Hestor, Engineer James E. Evans; Hunter, Capt. A. Clausen, Engineer Geo. Bellair; S. B. Barker, Capt. ——; Engineer ——; Wm. Maxwell, Capt. H. C. Plum, Engineer Louis Blance; City of Green Bay, Capt. B. Lewis, Engineer Fred Larson.

Toronto Ferry Co., Toronto, Ont.: Steamers—Primrose, Capt. C. Tafford, Engineer H. Brownley; Mayflower, Capt. George Moulton, Engineer S. A. Mills; Shamrock, Capt. T. Jennings, Engineer E. Abbey; Thistle, Capt. A. Martin, Engineer, C. Lerally; Kathleen, Capt. J. Fertile, Engineer Patrick Carr; Gertrude, Capt. J. Tymon, Engineer Wm. Hopkins; Island Queen, Capt. J. Titus, Engineer T. W. Wood; Luella, Capt. T. Hinton, Engineer John Smiley; J. L. McEdwards, Capt. William Scott, Engineer John D. McGinnis; Arlington, Capt. H. Farr, Engineer J. Wesley; Mascott, Capt. Henry Florio, Engineer Wm. Food.

Bessemer Steamship Co., Cleveland: Steamers—Sir Henry Bessemer, Capt. E. M. Smith, Engineer Richard Masten; Sir Wm. Siemens, Capt. R. E. Byrns, Engineer J. W. McEchron; James Watt, Capt. F. W. Stenton, Engineer Frank Warner; John Ericsson, Capt. H. W. Stone, Engineer R. L. Lawson; Sir Wm. Fairbairn, Capt. C. G. Ennis, Engineer S. W. Armstrong; Robert Fulton, Capt. N. B. Nelson, Engineer J. B. Hayward; Geo. Stephenson, Capt. John Lowe, Engineer H. J. Reynolds; James B. Neilson, Capt. C. E. Moody, Engineer E. W. Fox; Henry Cort, Capt. John Ward, Engineer Bernard Woods. Schooners—Sir Joseph Whitworth, Capt. H. A. Byrns; John Scott Russell, Capt. L. C. Cole; Alexander Holley, Capt. Peter Peterson; Geo. H. Corliss, Capt. Harry Gunderson; Alfred Krupp, Capt. Wilbur Holdridge; James Nasmyth, Capt. W. J. Hunt; Sir Isaac L. Bell, Capt. A. McArthur; Sidney G. Thomas, Capt. W. B. Clendenin; W. Le Baron Jenney, Capt. ——.

Bradley, M. A., Cleveland: Steamers—Alva, Capt. J. H. Wysoon, Engineer J. N. Kirby; Ceo. Stone, Capt. M. Mulholland; Engineer Edwin Black; Hesper, Capt. Paul Howell, Engineer P. H. Doyle; Pasadena, Capt. L. Stough, Engineer J. H. Gilbo; Gladstone, Capt. Henry Peterson, Engineer J. F. Mahaney; M. B. Grover, Capt. W. E. Morris, Engineer Richard Mahoney; City of Cleveland, Capt. C. H. Francke, Engineer John McCaffrey, Henry Chisholm, Capt. P. H. Smith, Engineer C. W. Eaton; R. P. Ranney, Capt. J. H. Holmes, Engineer A. R. Crook; E. B. Hale, Capt. Jas. Lawless, Engineer A. L. Eggart; J. S. Fay, Capt. Dick Neville, Engineer Robt. Simpson; Fred Kelley, Capt. ——, Engineer ——; Superior, Capt. S. C. Allen, Engineer ——; S. E. Sheldon, Capt. E. Saveland, Engineer G. F. Hunt. Schooners—Adriatic, Capt. A. B. Keller; John Martin, Capt. S. W. Gould; D. P. Rhodes, Capt. John Bridge; A. Cobb, Capt. N. Gifford; Sandusky, Capt. ——; Thos. Quayle, Capt. ——; Negaunee, Capt. A. B. Parsons; Southwest, Capt. Fred Green. (Blank spaces in the foregoing list do not indicate that men have not been selected for the vessels. The appointments have been made, but it is not certain that the vessels will go into commission.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, April 10, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago	9,683,000	7,965,000
Duluth	6,666,000	52,000
Milwaukee	205,000	3,000
Detroit	255,000	32,000
Toledo	935,000	1,855,000
Buffalo	587,000	72,000
	18,331,000	9,979,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 767,000 bushels of wheat and 47,000 bushels of corn. Grain afloat at Chicago April 10—Wheat 351,000 bushels, corn 3,991,000 bushels, oats 618,000 bushels, rye 281,000 bushels, barley 97,000 bushels; at Buffalo, corn 113,000 bushels, oats 81,000 bushels; at Duluth, wheat 918,000 bushels.

Appointments of Captains and Engineers for 1897, vest pocket size, $1.00. Order from the Marine Review, Cleveland, Ohio.

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio, by John M. Mulrooney and F. M. Barton.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, $1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats	416	45,109.47
Total	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30.	1891	204	111,856 45
" " "	1892	169	45,968.98
" " "	1893	175	99,271.24
" " "	1894	106	41,984.61
" " "	1895	93	36,352.70
" " "	1896	117	108,782.38
Total		864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (*From Official Reports of Canal Officers.*)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation	231	234	219	365	365	365

* *1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about ¼ per cent. of the whole, but largely in American vessels.

The first meeting of representatives of the shipping interests of the country, who are trying to unite upon a measure for the restoration of our mercantile marine, was held in Washington, a few days ago. The meeting was devoted to a general discussion of the subject, rather than an effort to reach any conclusions immediately, as it was agreed that an understanding between the various interests could best be reached through a committee. The committee as appointed is made up of representatives of the ship building interests, as well as the steamship companies. Senator M. A. Hanna of Cleveland will represent the ship building interests of the lakes. Mr. Hanna is a stockholder in the Globe Iron Works Co. of Cleveland, but it can not be said that as a senator he will be advancing his personal interests in this matter, as his ship building company, as well as lake commerce generally, will share only indirectly in any advantages that may come from legislation favorable to American shipping. Other members of the committee from the lakes are F. J. Firth, one of the vice-presidents of the Lake Carriers' Association, and Secretary C. H. Keep and Counsel Harvey D. Goulder of the same organization. It is probably unfortunate that the leaders of this movement excluded representatives of the press from their first meeting. It is well understood, of course, that when a large number of men interested in shipping come together, some ship builders, some owners of tramp vessels, others owners of organized lines, and some others American owners of vessels flying foreign flags, there would be considerable difference of opinion, and press reports might accentuate the difference, or might cause a wrong impression as to what is intended before any conclusions are reached. On the other hand, however, the promoters of this movement must expect that no matter what measure is proposed for the mercantile marine, they will find a strong opposition, even from members of the political party now in power, and the charge that their deliberations have not been entirely open to the public may be used to advantage by the opposition. It is understood that the idea in the appointment of the committee referred to was first to endeavor to harmonize all conflicting interests; to obtain all possible information as to the causes of the decline of American shipping; to report also upon what has been done by other countries, to encourage their shipping and to unite, if possible, upon a policy to be recommended to congress as a remedy for the existing situation in this country. As had been expected, the meeting was not enthusiastic on the subject of discriminating duties. Extended discussion of this subject of late is causing leading vessel owners all over the country to conclude that after all a carefully drawn subsidy measure would be preferable to legislation that would assuredly provoke retaliatory duties on our own products abroad. They have concluded, also, that such legislation is clearly contrary to the text of many of our treaties with other nations.

Although little is now heard of union seamen on the lakes, except through an occasional quarrel during the navigation season at Chicago and Milwaukee, it can not be said that the organization, which still flourishes on the Pacific coast and in some parts of the east, is dead, even in this part of the country. On several occasions of late dissatisfaction with the methods of the Lake Carriers' Association has been expressed by some members whose vessels are not of the larger class, and who have claimed that the work of the association in promoting deep channels, and in other respects, is largely to the interest of the big carriers. Probably nobody is watching these differences among vessel owners more earnestly than a few leaders in the Seaman's Union, who have stood by it for a long time past through many trials and with apparently little return for their labor. It must be admitted that the earnestness and the ability of some of these men would insure profit and advancement if applied in almost any other direction. T. J. Elderkin of Chicago is one of them. He keeps up a show of organization on the lakes, ready to step in at any time and take advantage of a weak point in the interests that oppose the union, and his reports to national officers in San Francisco would indicate that he is as well posted on lake freight conditions and the affairs of the Lake Carriers' Association as most members of that organization. He has only a straggling band of followers among men who were on sailing ships in the days of the old union, but he has kept up a semblance of organization and is now trying to include in the union "all men who follow the lakes for a livelihood, whether on steam or sail vessels." This broad qualification for membership is very probably intended for use whenever it may be found that the powers of the Lake Carriers' Association are lessened in any way. But the rememberance of days when vessel owners were at the mercy of a union that was unreasonable in its demands will always act against organization among men employed on lake vessels. If for any cause there should be disruption in the ranks of the Lake Carriers' Association, the old Cleveland Vessel Owners' Association would certainly be revived.

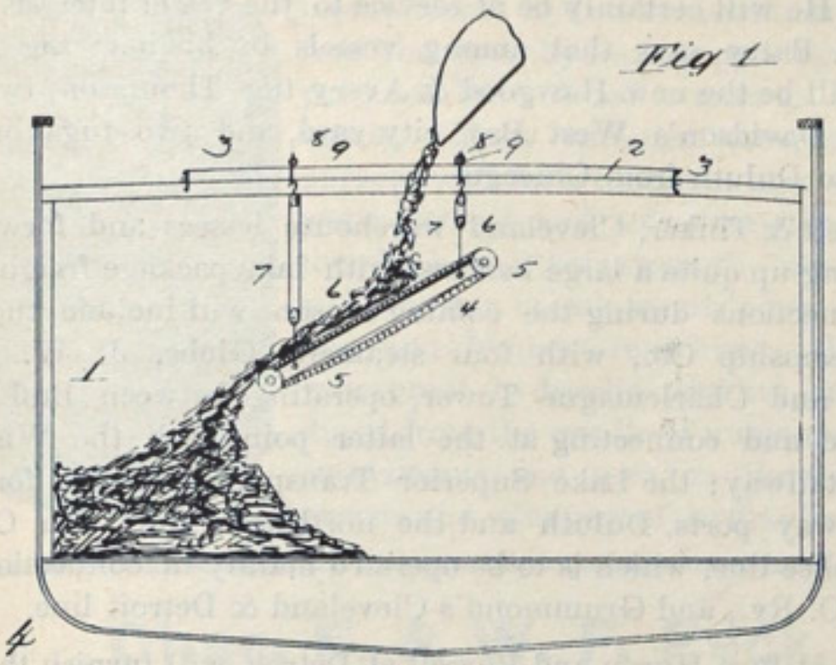
It is understood that Col. Lydecker, United States engineer in charge of the canal lock and other big government improvements in the Sault river, is now at Sault Ste. Marie, giving personal attention to the completion of dredging contracts and to directions as to the parts of the work that are to be hurried, so as to provide the greatest possible draft of water early in the season. Some arrangement will also be made at the Sault so that special care will attend telegraphic announcements regarding the draft of water through the river and canal. It is the intention of the government officials to give the vessels full benefit of the available draft, but groundings and accidents of all kinds that cause expense and delay must be avoided as far as possible.

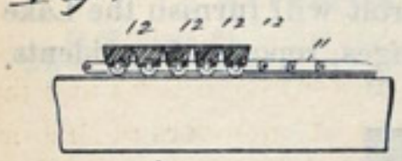
Canada's new government seems to be determined in its efforts to complete the St. Lawrence canals to 14 feet navigation within the next two years. The government estimates, which have just been submitted, call for $5,327,696 to be expended on canals during the coming year. Of this amount $1,250,000 is for the Soulanges canal, and other leading items are also for connecting parts of the St. Lawrence system. It is the general opinion that the design of the Canadian government in pushing the St. Lawrence canals to completion, in extending the Intercolonial railway and in continuing the Trent Valley canal is to give effective competition to American trade routes by a rail and water route controlled by the government from Fort William to Halifax, with branches into central Ontario.

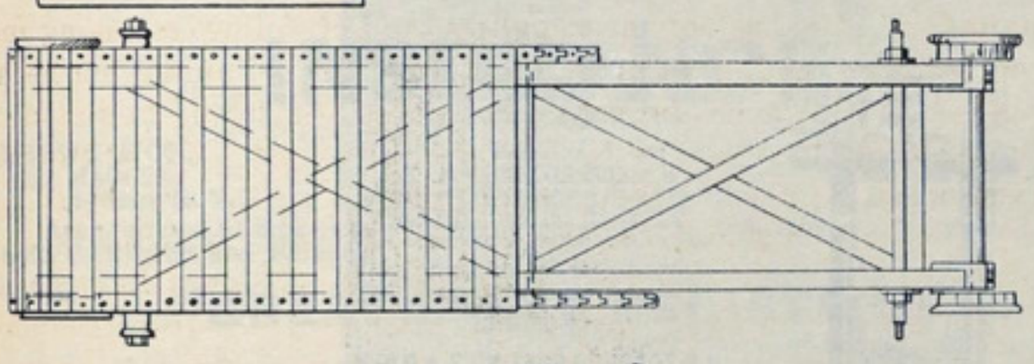
It would seem that the engineer branch of our navy is open to criticism on account of lukewarmness on the water tube boiler question. The British admiralty seems to be coming out of its great battle with flying colors. In order to increase the efficiency of the firemen service, they have decided to make warrant officers of some of the so-called engine room artificers, and they recently increased the salary of Mr. C. Albert J. Durston, engineer-in-chief of the navy, from $6,500 to $9,000, in recognition of valuable services rendered in the introduction of water tube boilers into the service.

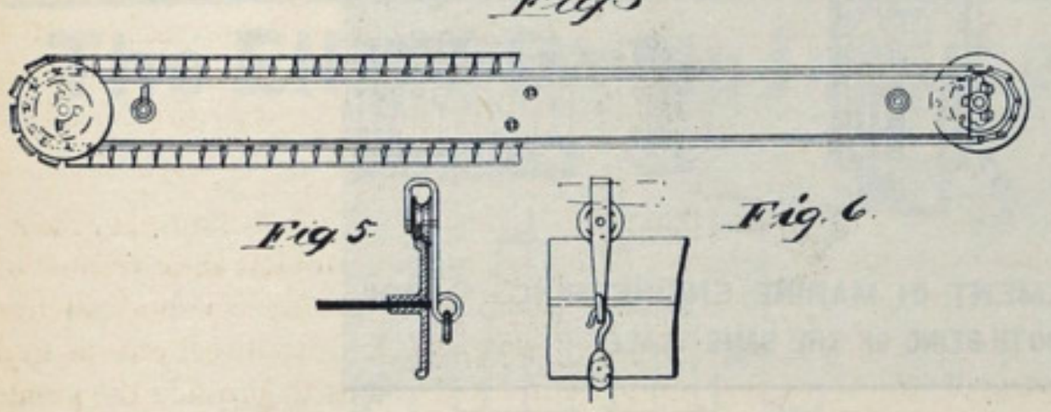
Ore Trimming Device.

The illustrations herewith show the invention of a Cleveland captain, C. G. Ennes, for trimming iron ore. Capt. F. W. Stenton of Cleveland is also interested in the patents. The drawings have been presented to a number of Cleveland vessel owners, and all of them have been impressed with the simplicity of the device and have expressed very favorable opinions of it. The principle of the tread-mill







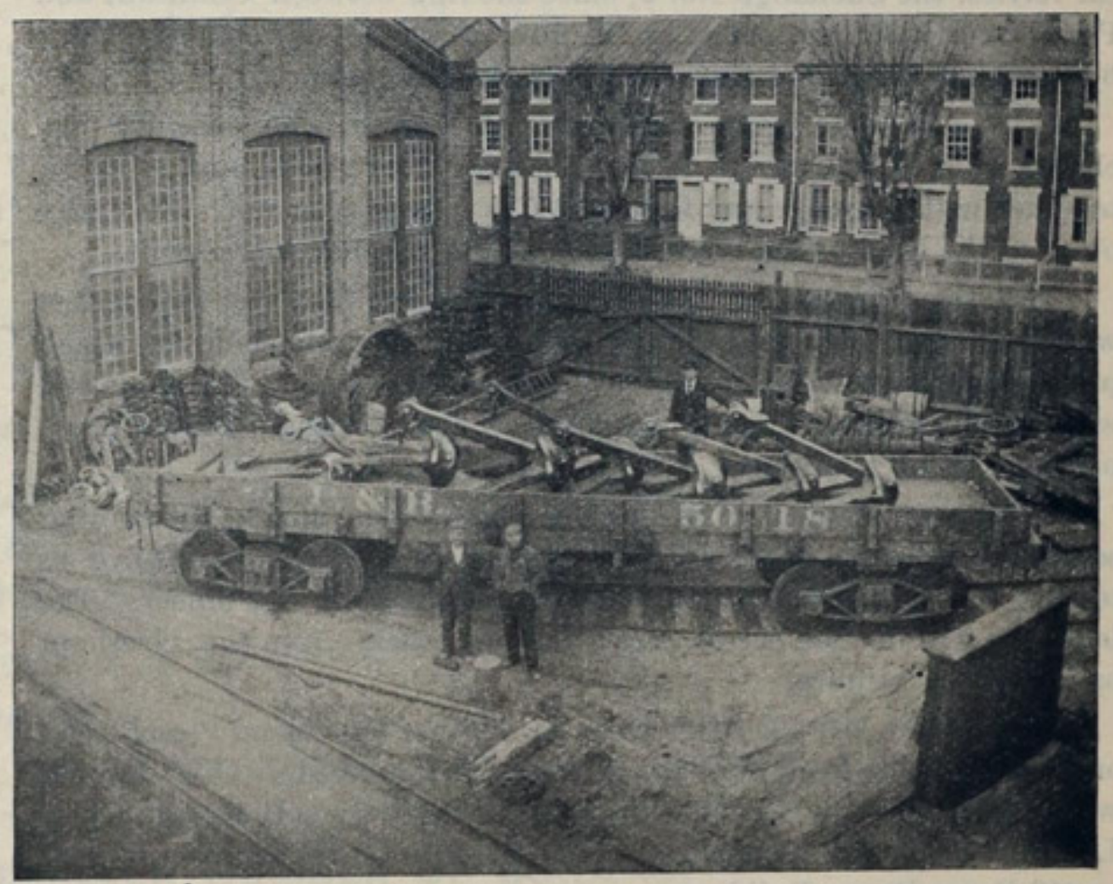


is used, a platform about 3 feet wide and some 12 feet long revolving around a frame by means of an endless chain. The platform is attached to the hatch combings by pulley ropes that can be adjusted so that either end can be raised or lowered, and the hooks supporting the platform are fitted with wheels that allow the apparatus to be moved from one side of the hatch to the other. The operation of the device is shown in figure 1, and its construction and details will be understood from the other figures. As soon as the ore strikes the platform it begins to revolve in the direction to which it is inclined, so that it trims the side of the vessel next to the ore pockets as well as the opposite side. The revolving of the platform shoots the ore to any pla :e desired, being regulated by the raising and lowering of the ends. It is claimed that wet ore and the fine Mesabi ore, as well as the coarser dry product, can be trimmed with this machine, as it is the weight of the ore that causes the endless chain arrangement in the platform to revolve. Any one interested in further particulars can address C. G. Ennes, 409 Perry-Payne building, Cleveland.

Harrington the Diver.

Editor Marine Review :—In several articles that have appeared in daily papers of the lakes of late about diving feats in great depths of water, I notice many misstatements about the recovery of a safe from the steamer Atlantic which was sunk in Lake Erie. I was in the wrecking business to some extent at one time, and I can give you facts—not what I have heard from others—about the Atlantic. This steamer was lost off Point au Pelee, Lake Erie, in 1854. A safe, which was in the clerk's office, contained about $200,000, belonging to the American Express Co. The first attempt to recover the safe with the large sum of money which it contained was made by a Mr. Green, who reached the wreck and broke in one of the windows of the clerk's office. He also managed to put in a small anchor line, but upon coming up from the wreck after partial success, he was unable to proceed further and died soon afterwards from the effect of injuires which he sustained in the work. Then a man from Chicago who had a patent cast iron armor, or diving dress, made several unsuccessful attempts to reach the vessel. The owners of this outfit left the wreck for the purpose of getting additional supplies, and while they were absent Mr. E. P. Harrington dropped anchor and took possession. He went down to the wreck in an ordinary diving suit, and upon reaching the hurricane deck found Mr. Green's anchor line. He followed the line to the clerk's office, where he found the broken window and the anchor inside, just as Green had told him before he died. In the work that followed, Harrington made five descents to the wreck, cutting out a piece from the side of the office with a saw and finally making a hitch to the safe, so that it was soon hauled up to the deck of the attending vessel. He took the safe to the Canadian shore before notifying the express company, but he turned it over to them without opening it. The depth of water from which the safe was taken was carefully measured and found to be 176 feet. Harrington remained down each time only five minutes. In addition to a sum of money paid to him, the express company also presented him with a handsome gold watch, the cases of which were made from some of the coin found in the safe. An engraving on one side represented Harrington descending in his diving dress, with the sloop on the surface and the wreck of the Atlantic on the bottom. On the other side was this inscription: "Presented to E. P. Harrington by the American Express Co. for recovering the safe from the steamer Atlantic in 176 feet of water off Point au Pelee, Lake Erie." The date was also noted but I have forgotten. I am, however, certain of the depth of water and other facts, as I have several times carried the watch myself for weeks at a time while on wrecking expeditions with him. His son, Wm. Harrington, who is a locomotive engineer in the employ of the Michigan Central Railway at Detroit, is now in possession of the watch. I lived in Detroit in Harrington's time, worked with him and attended his line and pump when he recovered copper from the cargo of the steamer Lac la Belle. I also remember his offer to the government to get the safe from the Cumberland, which was sunk by the Merrimack off Hampton Roads during the war. He was also anxious to go down to the steamer Pewabic, after she was sunk near Alpena in collision with the Meteor, but then, as now, it was impossible to locate the wreck. Your deep water divers have reason, even at this late day, to pass the palm to poor E. P. Harrington. Old vessel captains on the lakes must remember him. He was honest, kind-hearted and generous to a fault. He made several fortunes, but had no great love for money and gave a large part of what he possessed to friends. Here's respects to his memory.

Hearne, Texas. T. E. Kinney.



CAR LOAD OF STOCKLESS ANCHORS FOR LAKE SHIPS CONSIGNED BY BALDT ANCHOR CO., CHESTER, PA., TO THE UPSON WALTON CO., CLEVELAND.

Around the Lakes.

Quite a large number of vessels have been chartered to take lumber on first trips from the head of the lakes to Buffalo and Tonawanda at 1.62½.

A. E. Thompson, Cleveland agent of the Union Transit Co., announces that the first boat of his company's line for Lake Superior, the Eber Ward, will leave Cleveland April 20.

Captain George A. Zinn, U. S. A., gives notice that the light-ship was replaced, April 15, 1897, at the south end of the unfinished breakwater, Milwaukee bay, at the expense of the engineer department.

Capt. George P. McKay, Cleveland, has received a gas buoy model from the Safety Car Heating & Lighting Co. of New York. It shows the construction of the buoys that are being placed on the lakes.

The masters of vessels will find fifteen feet six inches of water entering Cheboygan harbor by keeping the ranges open a trifle to the eastward until near the lumber piles, when they should take the center of the river.

A. W. Hepburn of Picton, Ont., will have a new wooden consort in commission on the opening of navigation. Her name is Onteora, and she is about 1,100 tons capacity. She was built on Mr. Hepburn's marine railway.

Capt. John Smith and others of South Haven and Chicago have purchased the steamer City of Grand Rapids from Capt. Jay Hursley for $7,000. The boat will run between Chicago and South Haven during the coming season.

Capt. Dority, who had been in command of one of the Lake Erie car ferries, the Shenango No. 2, since the line between Conneaut and Port Dover was first opened up, is now in the F. & P. M. Ry. Co.'s big steel car ferry Pere Marquette on Lake Michigan.

S. C. Baker, dredging contractor of Duluth, who recently purchased from R. J. Cram of Detroit the tugs Jim Fuller and Crosby, together with a dredge and four scows, is preparing to move the entire outfit to the head of the lakes as soon as the weather will permit.

It is the intention of the Chicago Ship Building Co. to conduct with their own force the building of the new machine shop, for which preparations have been going on for some time past. The plans and working drawings are being prepared by the Wellman-Seaver Engineering Co. of Cleveland.

In the enforcement of Sault river regulations during the coming season, the new revenue cutter Gresham, Capt. Davis , will have as tenders two fast steam launches, each in charge of an officer. The launches will do the patrol work, taking orders from the Gresham as conditions require.

A change takes place this week in another Cleveland vessel brokerage firm. The firm of Palmer & Co. is dissolved. C. F. Palmer will retain offices on the fifth floor in the Perry-Payne Bldg.,and Chas. L. Hutchinson will do business under the firm of Hutchinson & Co. at 412 Perry-Payne Building.

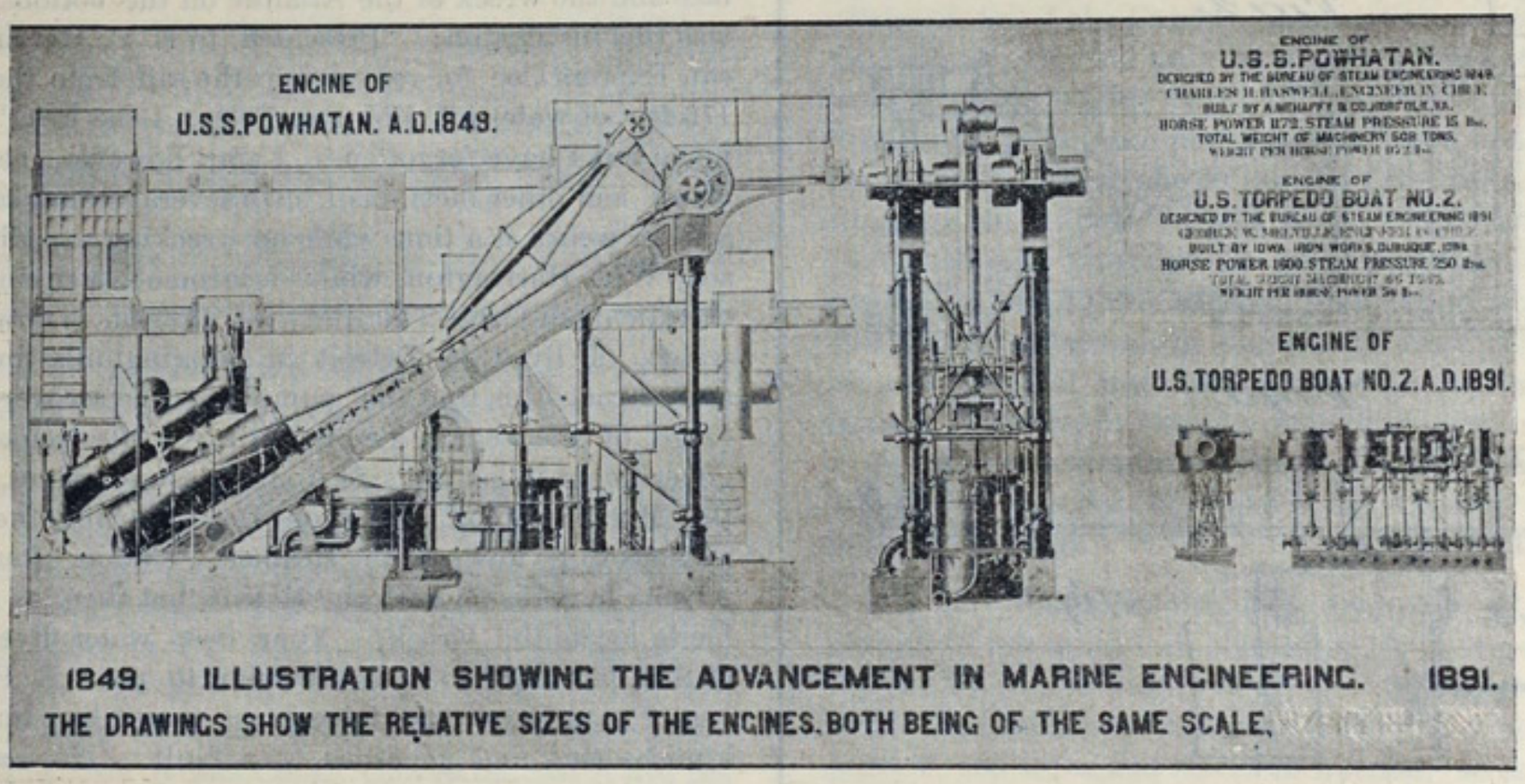
According to a time schedule just issued by the passenger department of the Northern Steamship Co., the big passenger steamers North West and North Land will leave Buffalo, westbound, on Tuesday and Friday nights, and will leave Duluth, eastbound, on Saturdays and Tuesdays at 1:30 p. m. The first sailing from Duluth will be on Tuesday, June 15, and from Buffalo on Friday, June 18.

Capt. Miles E. Barry of Barry Bros., tug owners of Chicago, is now a member of the city council at that place, and is fortunate in having been appointed chairman of the committee on harbor and bridges. He will certainly be of service to the vessel interests of the city. Mr. Barry says that among vessels in his new tug line at Duluth will be the new Hawgood & Avery tug Thompson, two new tugs from Davidson's West Bay city yard, and two tugs that will be taken to Duluth from Chicago.

Bartlett & Tinker, Cleveland warehouse lessees and forwarders, are building up quite a large business with lake package freight lines. Their connections during the coming season will include the Great Lakes Steamship Co., with four steamers, Globe, J. W. Moore, Olympia and Charlemagne Tower, operating between Buffalo and Manitowoc and connecting at the latter point with the Wisconsin Central Railway; the Lake Superior Transportation line, for Lake Superior way ports, Duluth and the northwest; the Owen Chicago & Milwaukee line, which is to be operated mainly in connection with the B. & O. Ry., and Grummond's Cleveland & Detroit line.

Lynn at Port Huron and Burrell at Detroit will furnish the Lake Marine News Association with vessel passages, reports of accidents, etc., during the coming season, and vessel masters are requested to give to this association any information they may have that is of general interest. This association serves vessel owners as it furnishes passages to all newspapers throughout the lakes, and maintains its own stations at Mackinaw and the Sault. Mr. Hughart, manager for the Western Union Telegraph Co., is the representative of the association at the Sault.

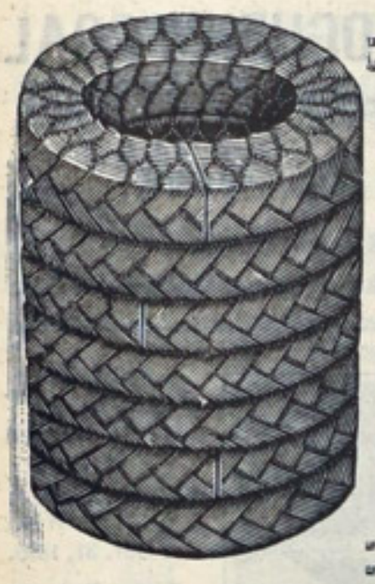
Assessors in the different lake cities who have used the Inland Lloyd's insurance register for the purpose of fixing tax values on vessels, are very probably disappointed in finding that the register for this year does not contain values on vessels that are worth more than $50,000. They will probably never again find a classification register that will note values. None of the leading registers of the world enter into the question of a ship's value in money. They deal with their qualities from the standpoint of seaworthiness. The underwriter does the rest.


ENGINE OF
U.S.S.POWHATAN. A.D.1849.
ENGINE OF
U.S.S.POWHATAN.
ENGINE OF
U.S.TORPEDO BOAT NO.2.
ENGINE OF
U.S.TORPEDO BOAT NO.2. A.D.1891.
1849. ILLUSTRATION SHOWING THE ADVANCEMENT IN MARINE ENGINEERING. 1891.
THE DRAWINGS SHOW THE RELATIVE SIZES OF THE ENGINES, BOTH BEING OF THE SAME SCALE.

Secretary Long of the navy has called for bids on the three 30-knot torpedo boats authorized by the last congress . Bids will be opened Monday, June 14. The boats must be completed within eighteen months from date of contract. The successful bidders must show themselves in possession of the necessary plant within three months after signing the contract. The boats will be known as Nos. 19, 20 and 21. Two of them must have a trial displacement of not less than 230 tons and one of 260 tons. The bidders are left ample scope for original ideas, as the department prescribes in its circular only the barest outlines of the craft, for the construction of which congress has appropriated $800,000.

Garlock's Waterproof Hydraulic Packing.

Every engineer has experienced vexatious annoyances and loss of time from the use of cheap, inferior, worthless hydraulic packings, and on account of the continued increase of pressures, there has been a constant demand for a superior packing, which would meet all of the requirements of the present day, for packing the plungers and pistons of pumps, pumping machinery, hydraulic elevators and hydraulic machinery. Heretofore the best hydraulic packings for these purposes have failed to meet all the requirements. Many varieties have answered the purpose well for a time, but they soon become water soaked and soft from the use of oils, thereby losing their strength, causing pistons and plungers to leak, requiring constant attention and frequent repacking. The Garlock waterproof hydraulic packing has been produced from the results of numerous practical experiments and tests on the water ends of pistons and plungers of hydraulic machinery and elevators, pumps and pumping machinery, and the results have fully justified the claim of the manufacturers that they have produced a first class waterproof packing, made of the best quality of selected flax and lubricated with their waterproof compound, which is strictly free from acid. These goods are furnished on rod and stuffing box measurement only, as they must be of an exact fit to give the desired results. Engineers will appreciate the advent of this packing. The Garlock Packing Co. are the sole manufacturers.



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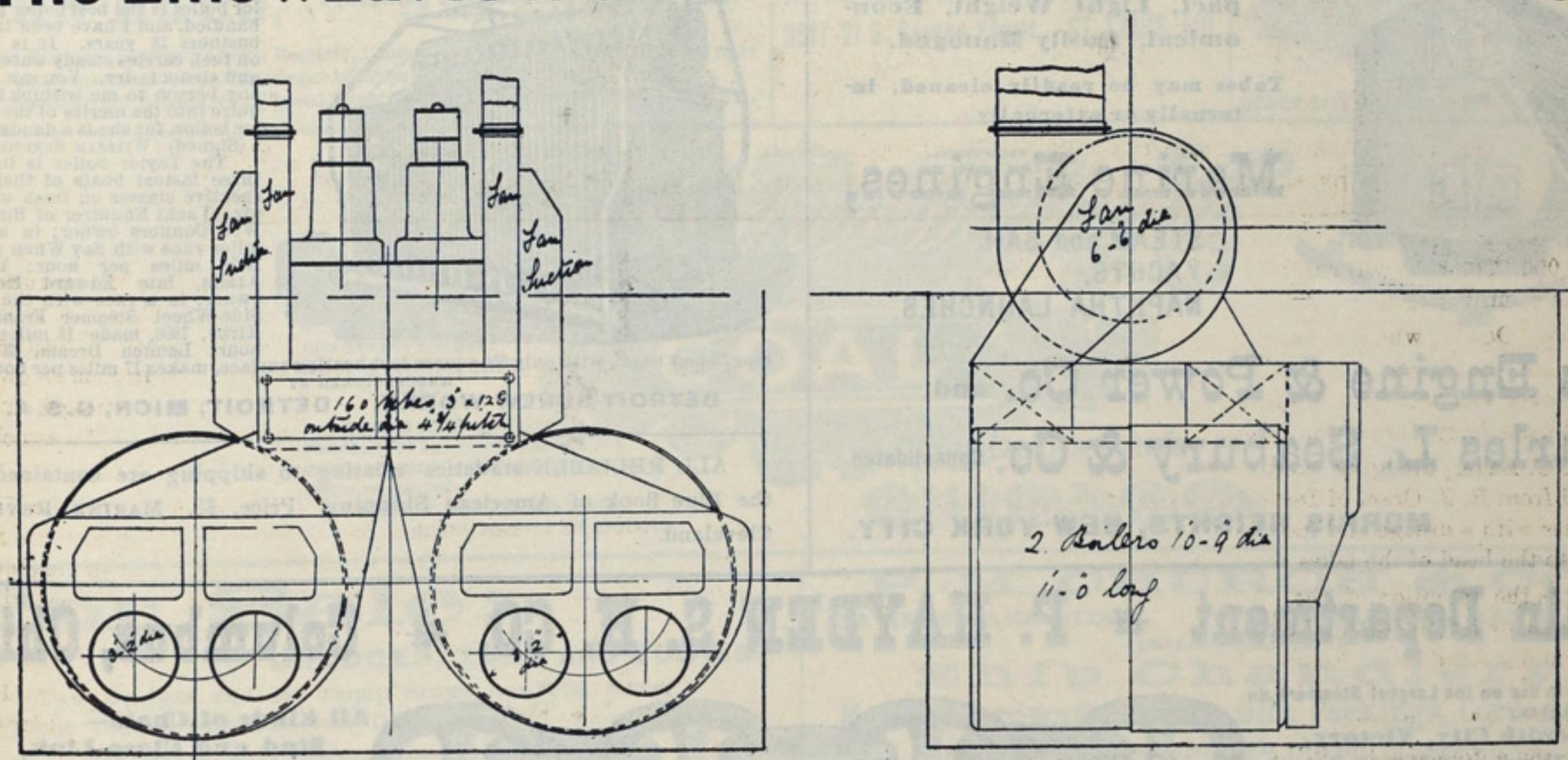

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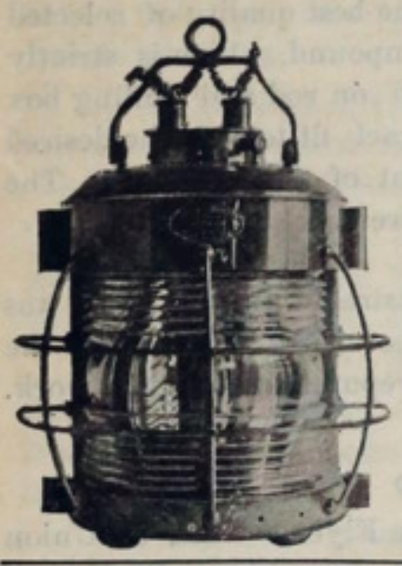

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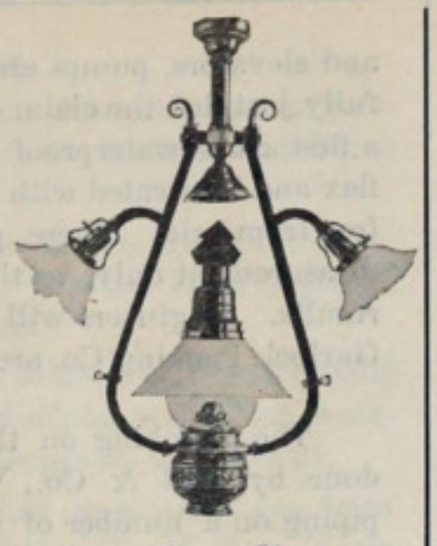

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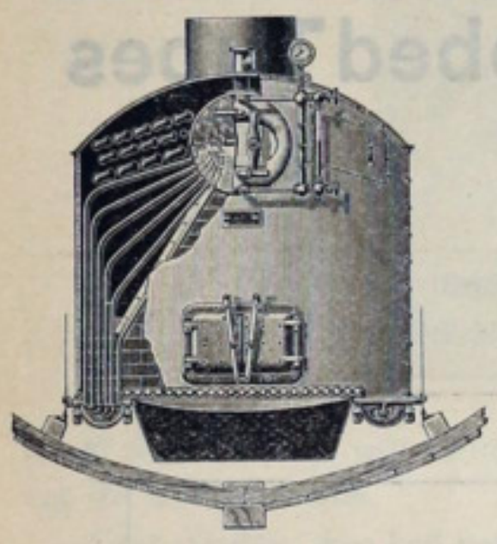

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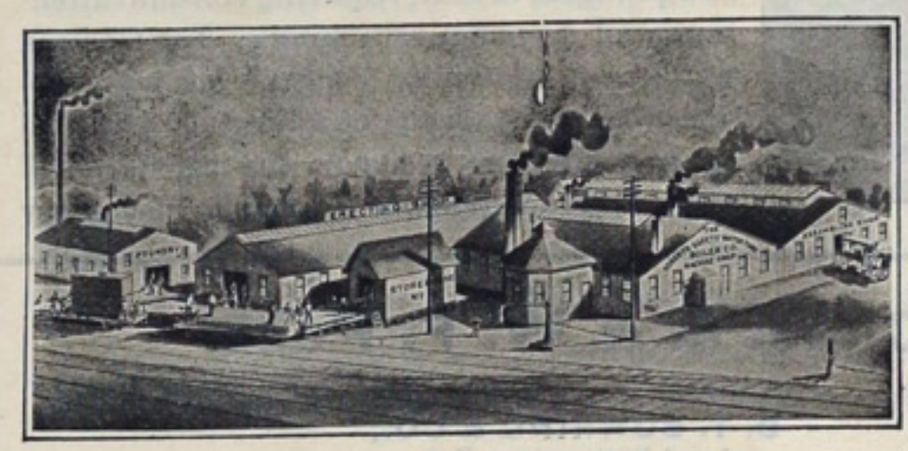

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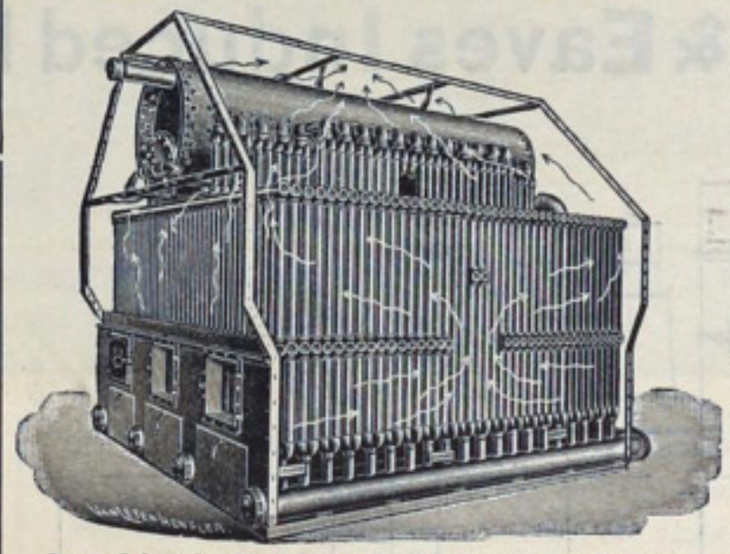

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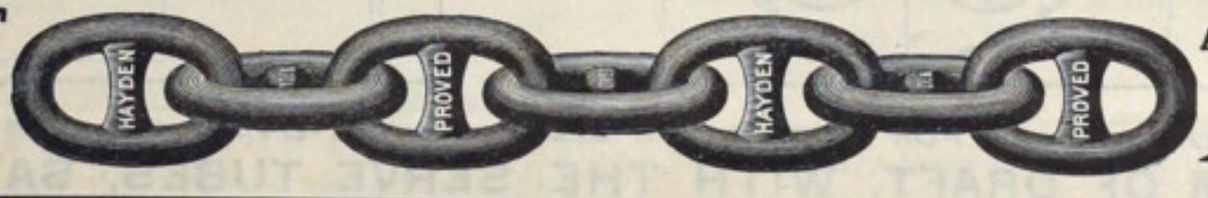

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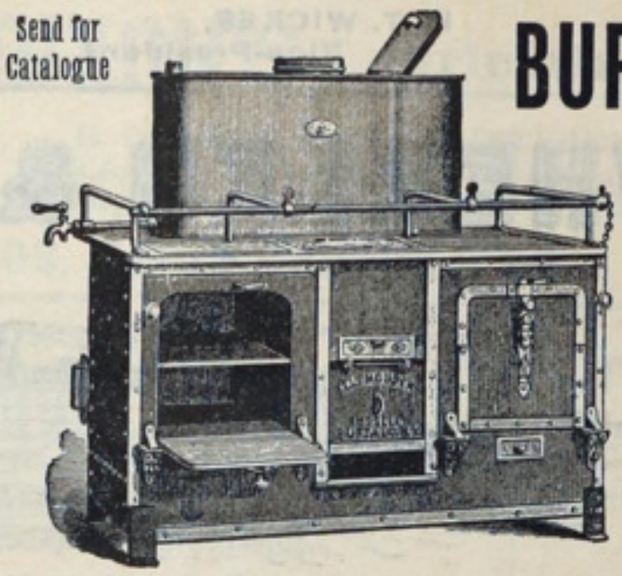

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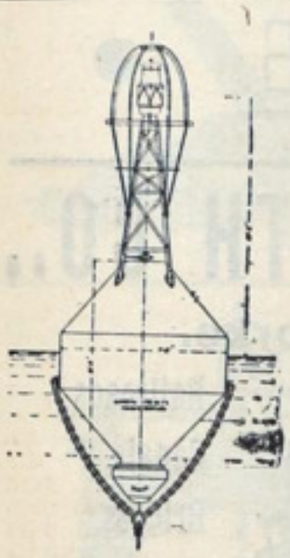

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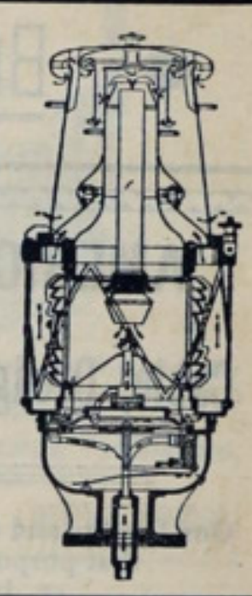

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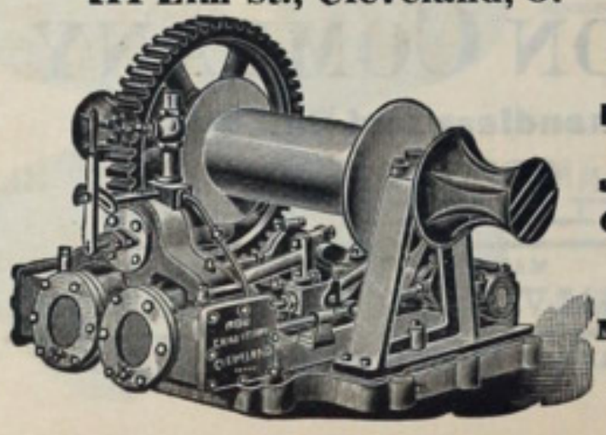

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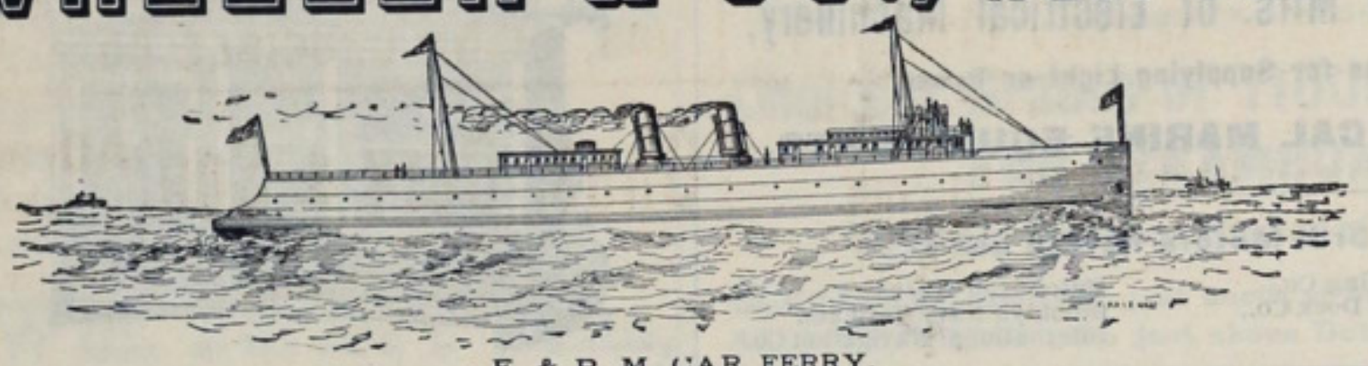

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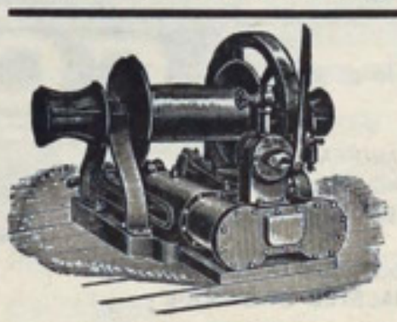

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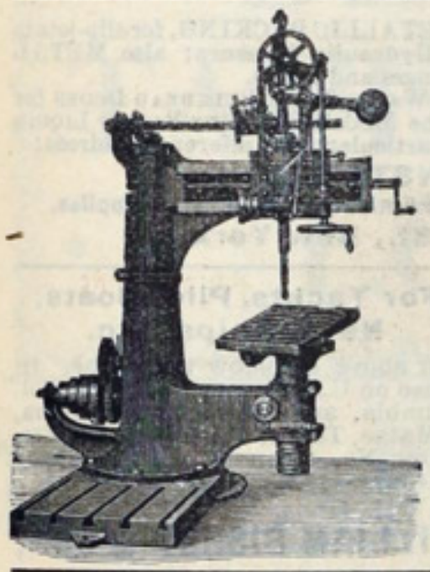

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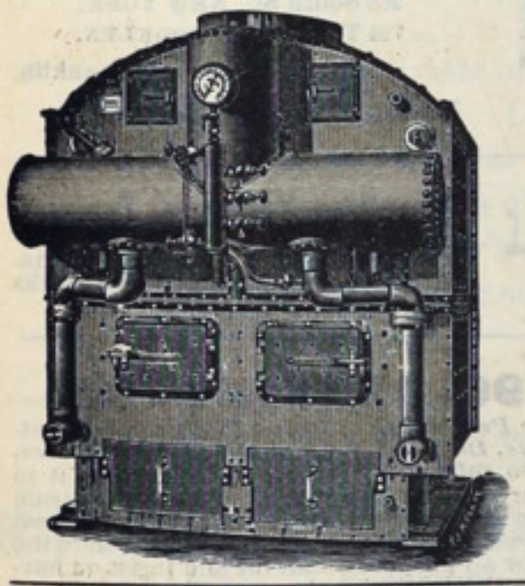

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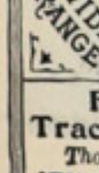

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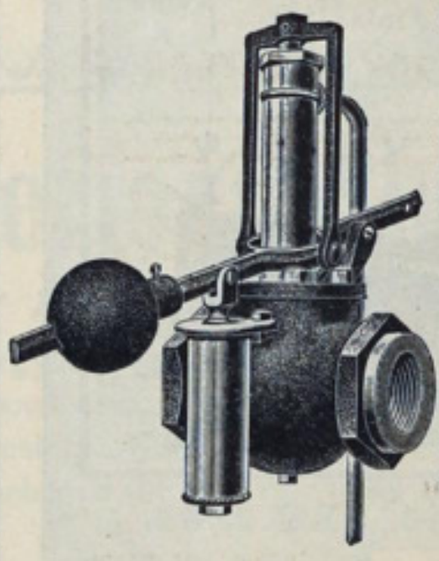

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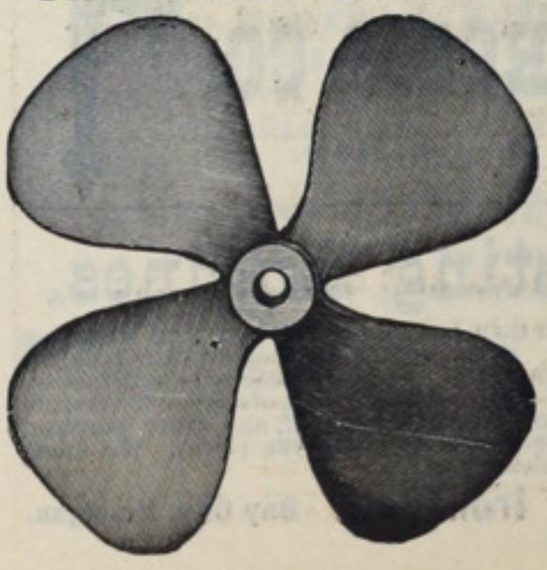

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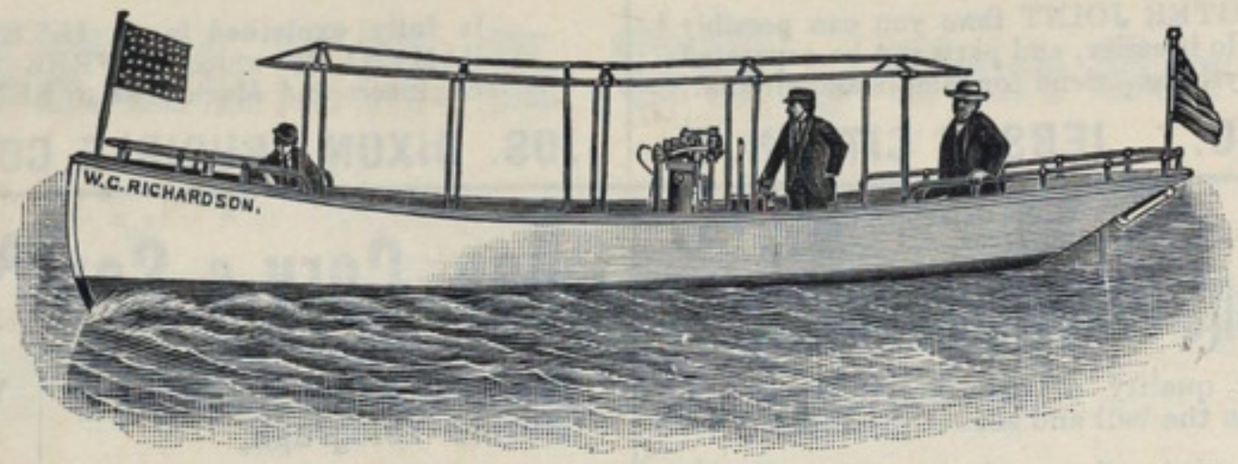

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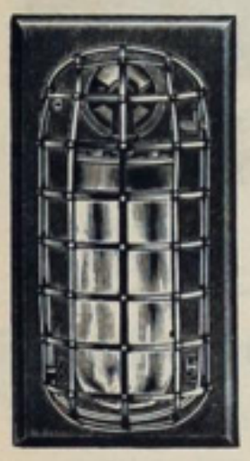

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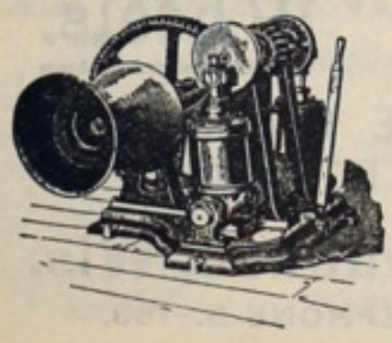

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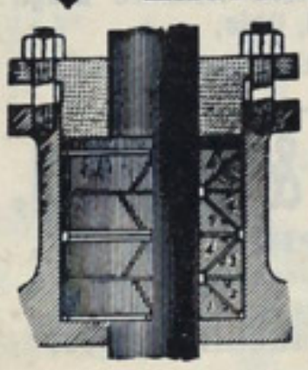

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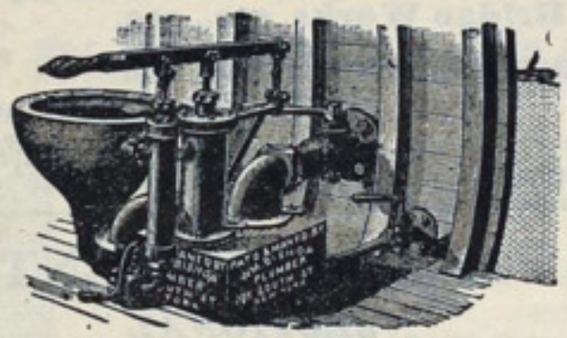

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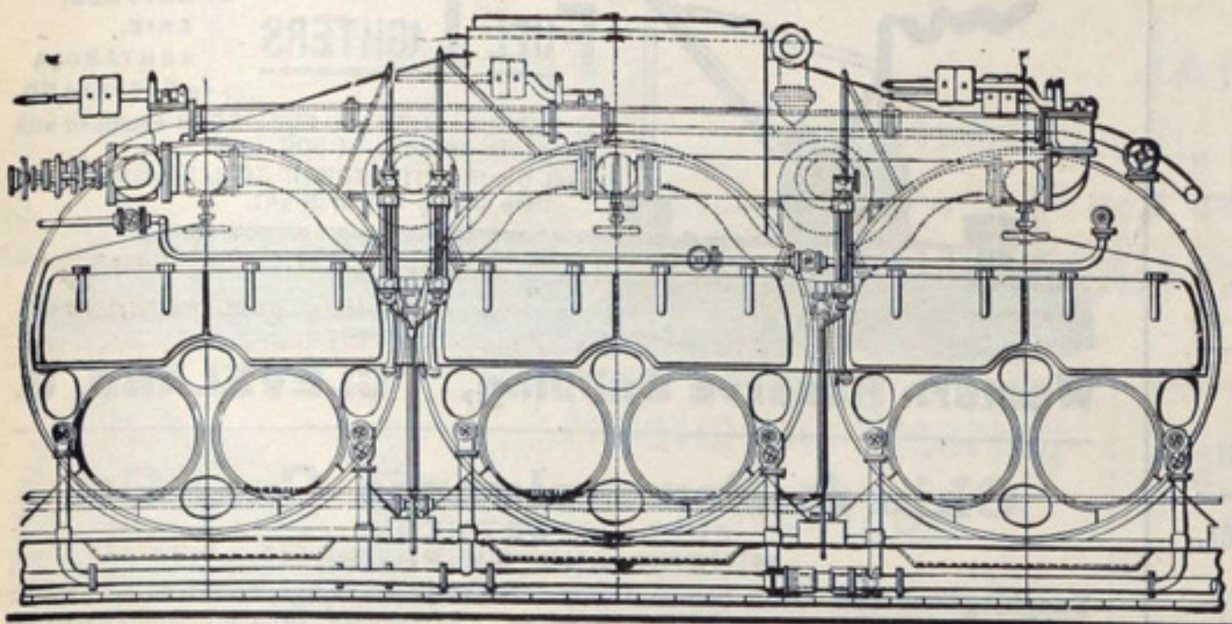

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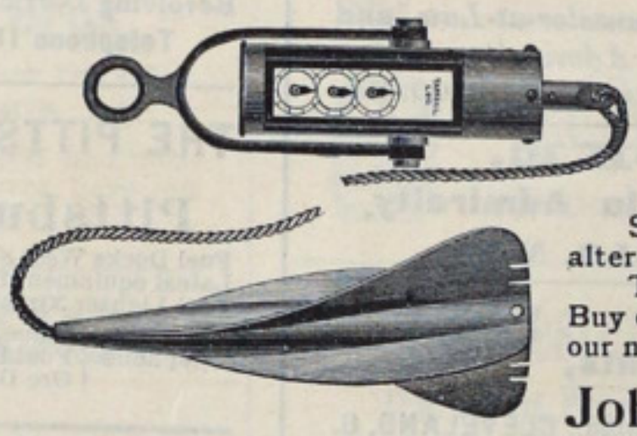

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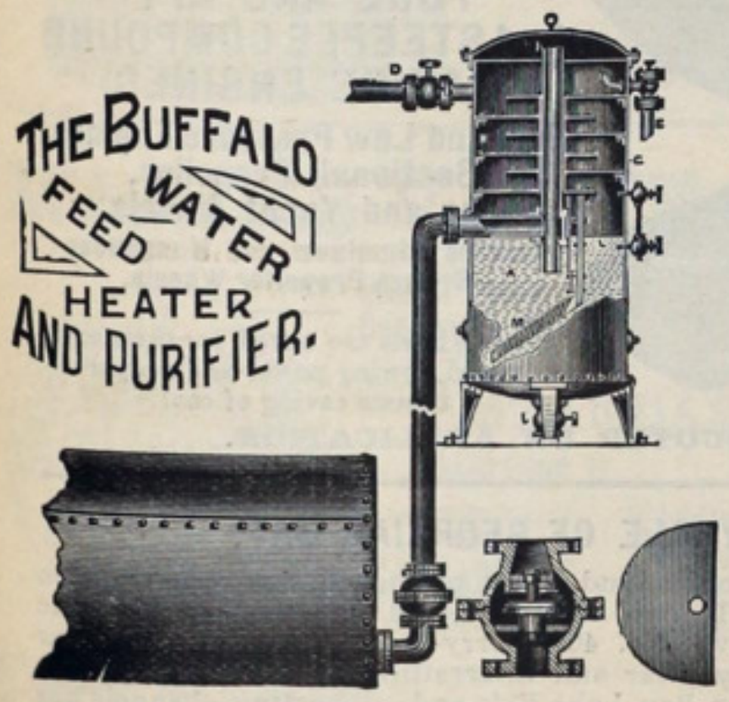

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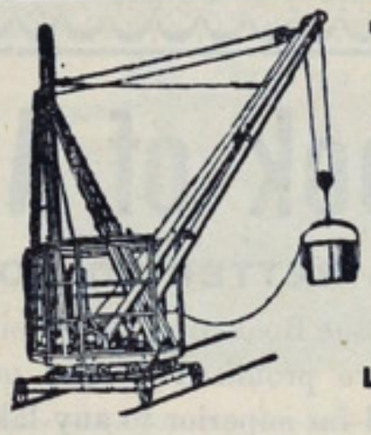

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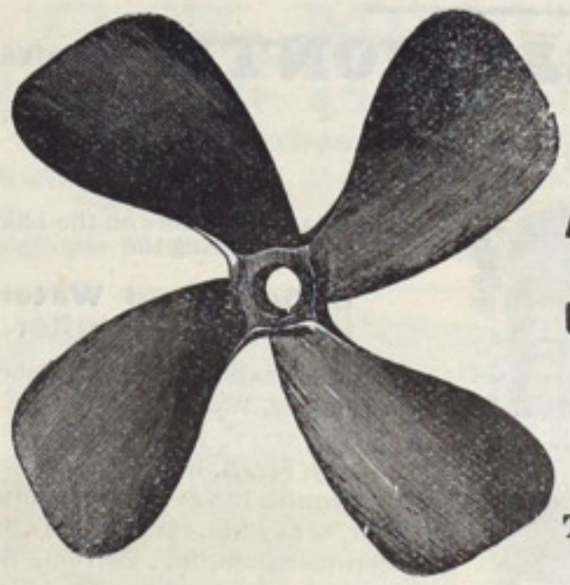

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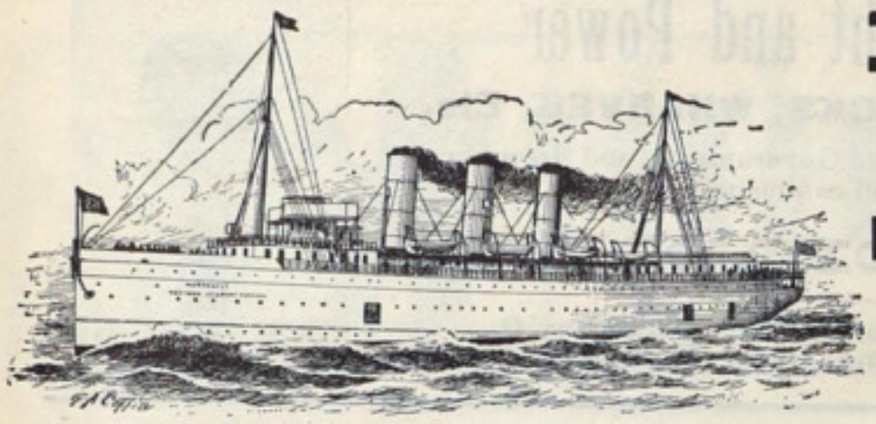

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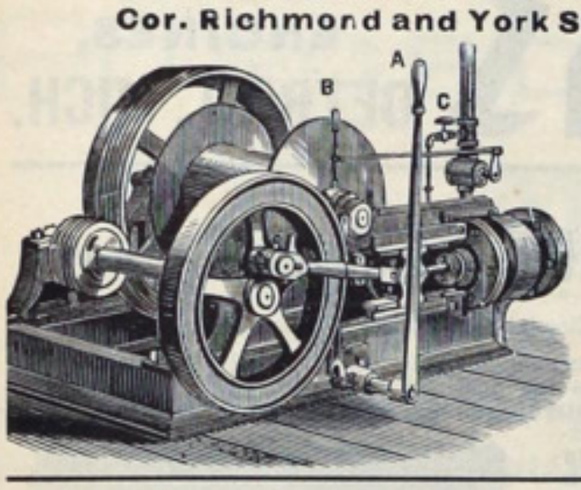

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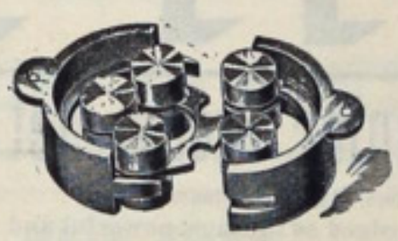

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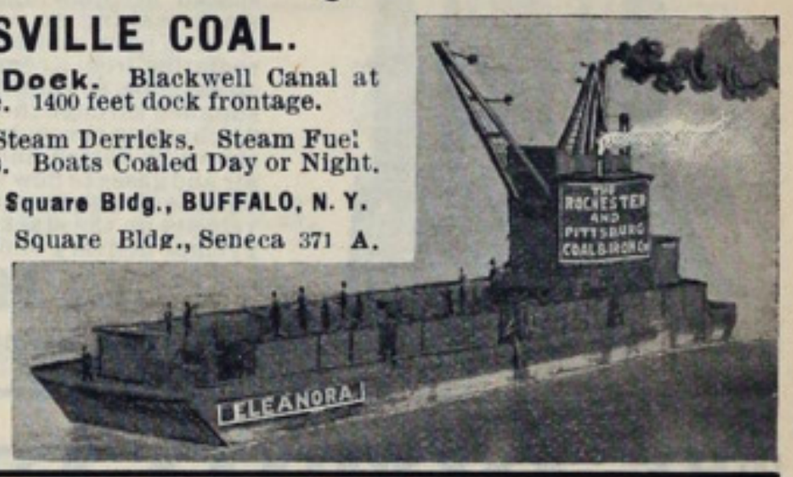

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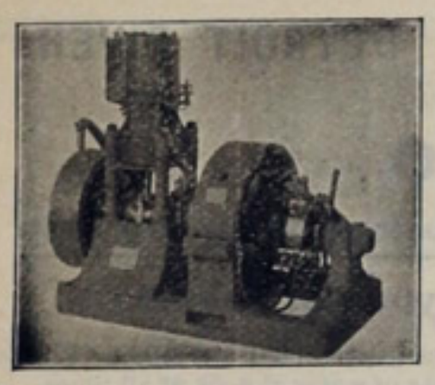

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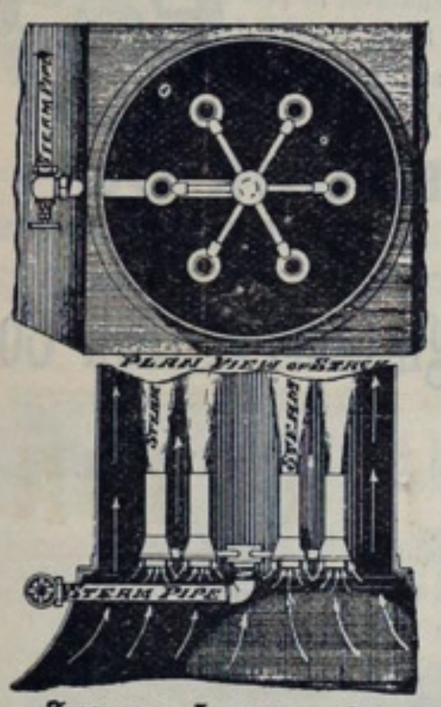

Section View of Stack Showing Jet in Operation.

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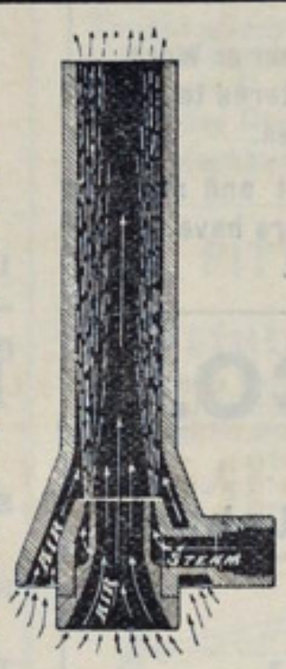

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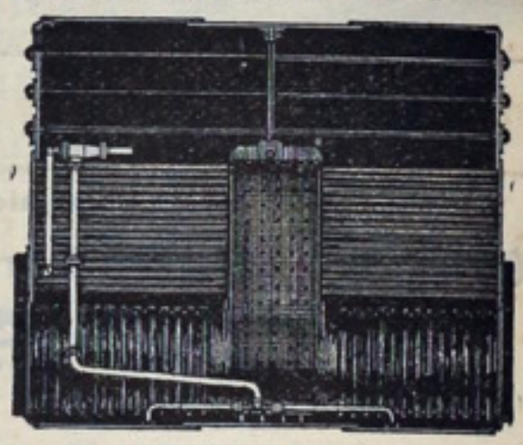

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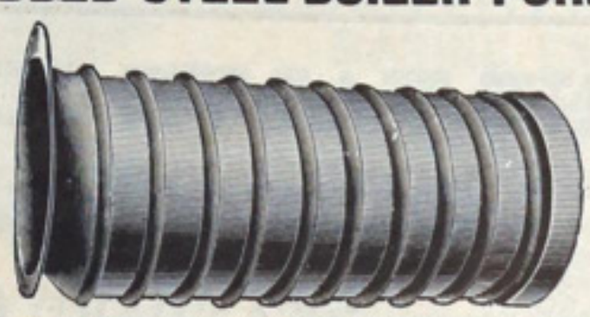

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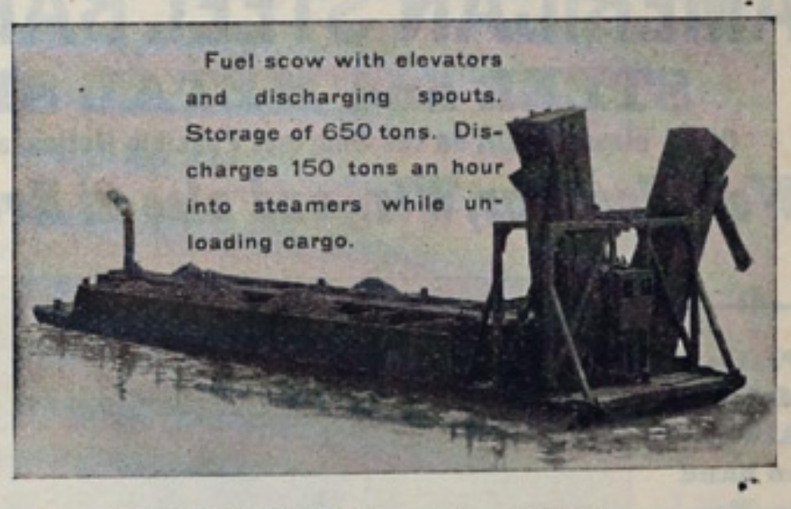
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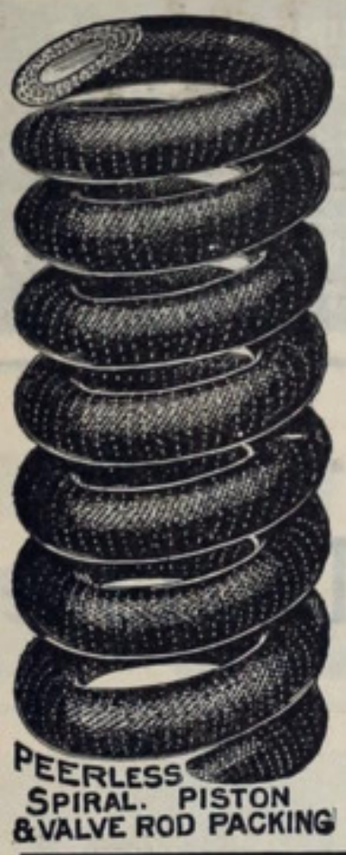

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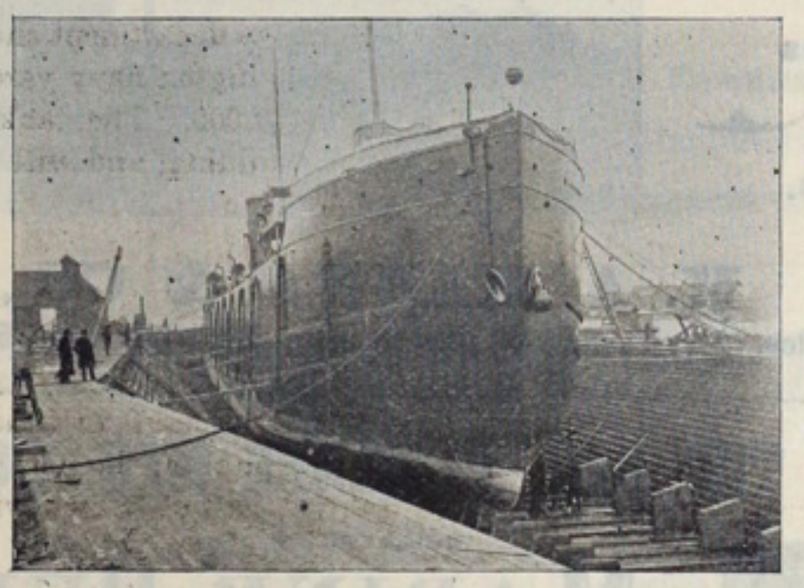

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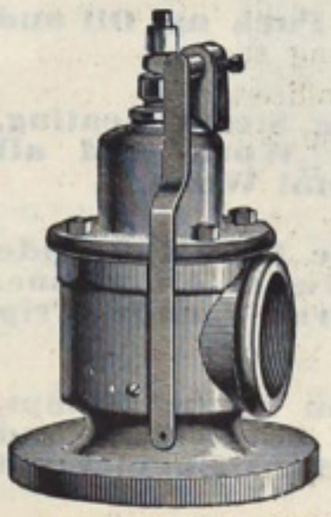

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